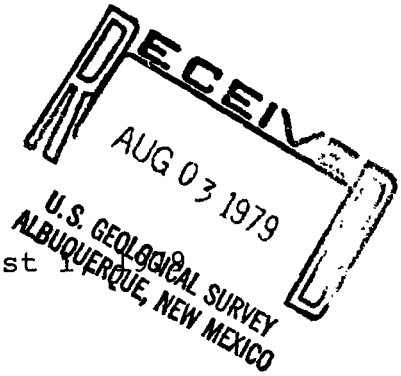
ANACONDA Copper Company
New Mexico Operations
P.O. Box 638
Grants, New Mexico 87020
505/876-2211



August 1, 1979

Mr. A. F. Czarnowsky
Area Mining Supervisor
U. S. Geological Survey
P. O. Box 26124
Albuquerque, New Mexico 87125

Dear Mr. Czarnowsky:

Enclosed are three copies of a letter we sent to Floyd R. Correa, Governor, Laguna Pueblo, reviewing the matter of Hydrauli Mining Tests we have tentatively scheduled for the Jackpile mine site later this year.

We believe that this letter addresses those points you require for a mine plan for this specific activity.

The impact of these tests on local ground water will be minimal as the process water used as the cutting mechanism does not contain chemical additives (it is strictly a hydraulic cutting mechanism) and all process water used in the cavity will be slurried with the eroded ore and pumped to the surface. The hydraulic gradient is always toward the cavity and no process wat will enter the aquifer.

We request your approval of this test program. If you have any questions, please contact me.

Sincerely,

Meade Stirland
Manager Engineering, Health & Safe

MS:gbl
cc: R. D. Lynn
J. Grunig
F. R. Correa, w/o encl.

9393189

NACONDA

July 18, 1979

The Honorable Floyd R. Correa
Governor, Pueblo of Laguna
P.O. Box 194
Laguna, New Mexico 87026

Dear Governor Correa:

We appreciate the action of the Council on June 27, 1979, granting us permission to test the concept of hydraulic bore hole mining within our lease area. We are hopeful that this action will result in eventual mining activities beneficial to both the Pueblo and Anaconda.

As was presented to the Council, Anaconda plans to conduct two separate tests as follows:

1. The tests will be conducted by drilling a 17-3/4 inch hole through the ore zones and cased with 16 inch steel casing. Equipment belonging to the United States Bureau of Mines and other rented equipment will be used to mine the ore in the manner as described in the attached copy of Technology News dated October, 1978. The ore that is recovered will be accumulated in slurry form in lined ponds about 100 square feet in size. After dewatering, the ore will be placed in stockpile and shipped with other mined ore to the mill for processing.

2. The first test site, as shown on the attached map, is located east of Paguate about 1800 feet east of the highway. The ground there has a gentle slope to the northwest. It is essentially undisturbed. We have drilled exploration holes there and outlined a small area of mineralized sandstone immediately below the Dakota formation. A cavity will be mined about 50 feet in diameter from about 150 feet to 156 feet.

3. The second test site is located approximately 3000 feet west of Anaconda's employee housing as shown on the attached map. Here, too, the ore is located about 150 feet below the surface and a cavity of approximately 50 feet in diameter and four feet high is planned to be excavated.

4. After the test is completed at Site No. 1, we will restore the ground to its approximate original contour and seed it with appropriate vegetation. Site

No. 2 is currently scheduled to be stripped for open pit mining of nearby ore and, therefore, would be included in the total mine reclamation. In the event Site No. 2 is not affected by our mining operations, we will restore the surface to its approximate original contour and seed it with appropriate vegetation.

5. Anaconda will leave both of the test cavities open for a period of time, perhaps up to two years, to monitor roof stability of the cavities.

6. The water that will be utilized for the test will be accumulated from our employee housing water well over a period of time and will be recycled during the tests. The water will be sampled and analyzed during the tests and, upon completion of the tests, will be placed into our mine industrial water storage.

7. Anaconda will keep the Pueblo advised as to the progress and results of the tests. The information gathered from the tests will also be made public inasmuch as it is utilizing equipment developed by the United States Bureau of Mines.

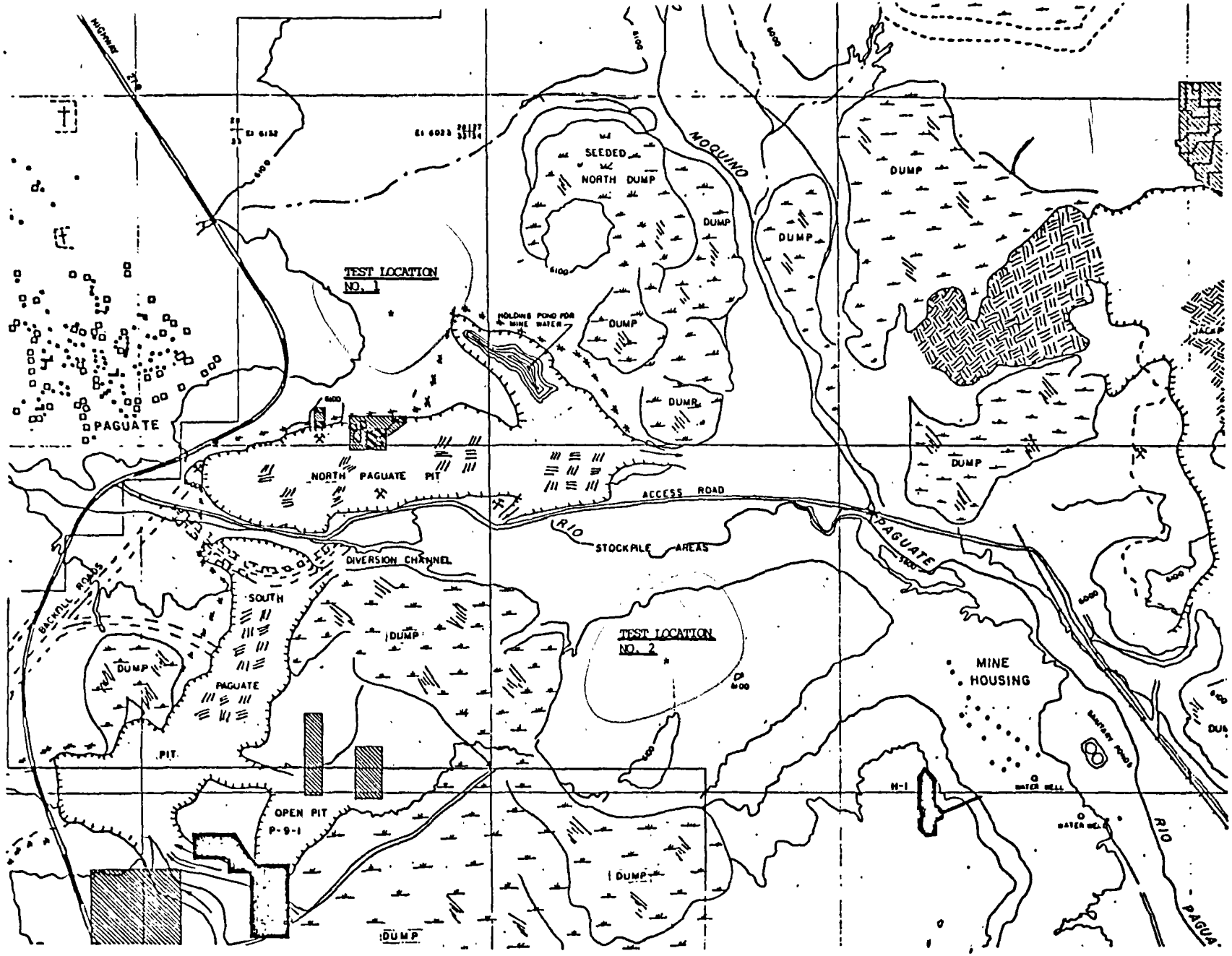
The United States Bureau of Mines' equipment is expected to become available to us in September of this year. We estimate the tests will take approximately two months to complete after the equipment is on site. Again, we appreciate your support and approval. Please do not hesitate to call us if you have any questions.

Very truly yours

R.D. LYNN
General Manager

RDL/jms
Enclosures
xc: U.S. Bureau of Mines
U.S. Geological Survey

bxc: A.J. McDonell
C.C. Howard
J. Grunig
M.J. O'Neill


HIGHWAY 278
SEEDED
NORTH DUMP
MOQUINO
DUMP
TEST LOCATION
NO. 1
HOLDING POND FOR MINE WATER
PAGUATE
NORTH PAGUATE PIT
ACCESS ROAD
RIO
STOCKPILE AREAS
PAGUATE
DIVERSION CHANNEL
SOUTH
BACHILL RIDGE
TEST LOCATION
NO. 2
MINE
HOUSING
OPEN PIT
P-9-1
PIT
H-1
RIO
PAGUA

EXHIBIT

Technology News

FROM THE BUREAU OF MINES
UNITED STATES DEPARTMENT OF THE INTERIOR

Technology News provides information on the results of the Bureau of Mines Mining Research Program. It is published to encourage the transfer of this information to the mining industry, and its application in commercial practice. A free subscription may be obtained by writing to the Technology Transfer Group, Bureau of Mines, 2401 E St. N.W., Washington, D.C. 20241.

No. 56, October 1978

Single Borehole Mining of Uranium Ore

Objective

To mine uraniferous sandstone in an economically feasible and environmentally compatible manner without placing men underground.

Approach

Uraniferous sand is remotely extracted through a single borehole by cutting into the ore around the borehole with a high pressure water jet, and pumping the resulting slurry to the surface.

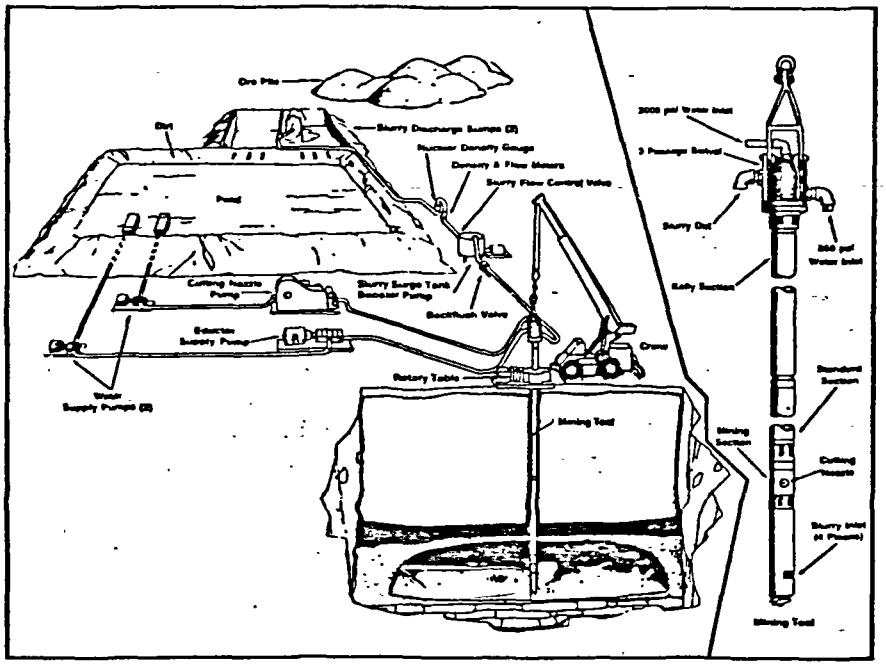
How It Works

A 16-inch-diameter borehole is drilled from the surface down into the buried mineral deposit, and the mining tool is installed. High pressure water is released as a jet from a nozzle in the mining tool to erode the ore, forming a slurry that flows to the bottom of the cavity. The slurry is drawn into inlets located near the bottom of the drill string. See drawing.

After being pumped to the surface, the slurry is weighed, metered, and checked for radioactivity. It is then deposited into one of a pair of sumps. Water collecting in the sumps drains into an adjoining pond for reuse. Thickened ore in the sumps is removed and placed in piles.

The mining tool consists of a 12-inch-diameter drill string and accessories, that is tipped with a mining section. This section has an auger at the bottom. Four slurry inlet holes and the eductor are located above the auger, and the single cutting nozzle is located near the top of the mining section.

A kelly section on the surface is connected to the mining section by lengths of standard pipe. The kelly section along with all the sections below it, can be rotated by means of the rotary table. Rotation is used to auger down into the broken ore in



System and tool for single borehole slurry mining.

the borehole; it also allows the water jet to be turned.

Above the rotatable kelly section, there is a non rotating swivel section which is suspended from a crane. The swivel section contains two water inlets and one water outlet. These are connected to three annular passages, which in turn connect through the standard section to the mining section.

The underground system is powered by two sources of high pressure water on the surface. Water from a 2,000 psi pump is released from the cutting nozzle to erode the ore. Water from an 800 psi pump drives the eductor used to suck slurry from the mined cavity into the return flow.

The eductor was adopted for drawing off the slurry after repeated failures of pumps installed at the bottom of the drill string. The eductor, a low-efficiency, venturi section device has the overriding advantage of no moving parts. No failures or problems have occurred while pumping the abrasive uraniferous sandstone slurry or other slurries.

System benefits include:

1. Precludes health and safety problems of underground mining.
2. Ore fragmentation and transportation are a single continuous process.
3. Small or erratic deposits can be mined.
4. Production begins without underground development.
5. Crushing and grinding are unnecessary.
6. Environmental impacts are minimal. No overburden is removed. Groundwater quality is normally not impaired.

Test Results

This slurry borehole mining system is an outgrowth of Bureau of Mines research begun during 1973. Starting in July 1976 a coal mining design, built by Flow Industries to Bureau specifications, was tested for six weeks. Testing took place near Wilkenson, Washington on property of the Donald Hume Association, under a cooperative agreement with the Bureau. The first design was not economically feasible for coal mining, but analysis suggested that a higher output (40 tons per hour) system would be. Coal applications of this research are now responsibility of DOE.

To adapt the system to mining uranium-ore-bearing sandstone, the cutting pressure was reduced from 4,000 psi to 1,500 psi, and the flow was increased from 200 gpm to 1500 gpm. A second generation system was built incorporating a new nozzle and turning vanes, both designed by TRW corporation under a Bureau of Mines contract.

The improved system was successfully tested for six weeks beginning in July 1977. Testing took place at Nine-Mile Lake in Natrona County, Wyoming on property of the Rocky Mountain Energy Corporation under a cooperative agreement with the Bureau. During this testing ore was cut at horizontal distances of up to 25 feet and an average rate of 8 tons per hour. A total of 350 tons of uraniferous ore were mined from a 10-foot-thick seam at depths of 75 to 100 feet.

Testing of methods to prevent environmental damage should be completed this month. Two problems, subsidence of the ground above the mined cavity and the radioactivity of the ore tailings, are being attacked by injecting the ore tailings back into the hole. Future work includes evaluation of the effectiveness of this method for other minerals.

This mining system was developed by the Bureau of Mines through in-house research and contract research. The project officer is Dr. George Savanick of the Bureau's Twin Cities Mining Research Center.

Patent Status

The U.S. Department of the Interior is not applying for a patent on the borehole mining tool. The Department does hold a patent on a backwashing system that is often used with this tool. That system was invented by John B. Cheung and Earll M. Murman.

For More Information

Drawings and specifications are available. Requests should be addressed to:
Technology Transfer Officer
Bureau of Mines
Twin Cities Mining Research Center
P.O. Box 1660
Twin Cities, MN 55111